

**ABSTRACT**

A frequency domain based method using matrix rank reduction for removing noise from seismic data sets is provided using a variety of 3D eigen filtering techniques. A rank reduced grid of traces or proxy cube that is representative of an original grid of Traces, but that has a better signal to noise ratio results since the surviving data elements represent the bulk of the composite signal related to genuine reflectors - whereas the trivial elements replace a large portion of the composite signal related to random noise. There is no compression of the elements of the representative matrices. The use of a series of proxy cubes in place of the coordinate pair related original CUBEs of seismic data results in several advantages including reduced processing time and better accuracy at the boundaries of the subject section.